UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Science Center
P.O. Box 271
8604 La Jolla Shores Dr.
La Jolla, CA 92038

December 28, 1998

FINAL CRUISE ANNOUNCEMENT

VESSEL: NOAA Ship McArthur, 9902-AR, AR-99-01

CRUISE DATES: February 25 - March 10, 1999

PROJECT: Marine Reserves (MERRP), Coastal Fisheries Resources Division, SWFSC

ITINERARY: Depart Nimitz Marine Facility, San Diego, at 0900 on February 25, 1999. Sites to be occupied include the following: Big Sycamore Canyon Marine Reserve, Vandenberg Marine Reserve, Anacapa Island and San Miguel Island (see attached diagram). The order in which these sites will be occupied will be determined prior to departure by the principal investigators in collaboration with the ship's officers. A stay of 2-3 days at each site is anticipated. The cruise will be divided into two 7-day legs with an exchange of some scientific personnel taking place on Wednesday, March 3, in Santa Barbara, CA. The vessel will return to San Diego on March 10, 1999.

OBJECTIVES: 1. To determine the effectiveness of the targeted marine reserves as source areas for the production of fish eggs and larvae that will "re-seed" areas outside of the reserves.

2. To produce bathymetric maps and overlay habitat and sediment characteristics to produce a full description of available habitat within each reserve.

3. To determine spawning patterns and egg/larval development rates of resident fish species.

PROCEDURES: The basic sampling design/pattern will follow the four nominal depth contours of 20 meters, 40 meters, 60 meters and 200 meters at each site, with stations approximately 0.5 nautical miles apart. Sampling of each

nominal depth contour will begin at a predetermined station on one side of the reserve, pass through the reserve, and finish at a station on the other side of the reserve. Sampling will proceed around the clock until all stations are completed. Specific station coordinates will be provided prior to departure from San Diego. Each site will include the following operations:

A. Egg pump sampling. The egg pump will be used to continuously sample along the four nominal depth contours in and around each reserve. Sampling operations will begin at a predetermined station outside of the reserve, pass through the reserve along that nominal isobath, and finish at a station on the other side of the reserve. Once that particular depth contour pattern has been completed, the vessel will then move to the next depth contour. Full patterns will be run 4 times, ideally with two passes during the day and two at night. Vessel speed during sampling shall be 5 knots. All samples will be preserved in scintillation vials using 5% formalin.

B. CalBOBL (CalCOFI Bongo) plankton tows. Calibration of the egg pump samples will be accomplished by taking a series of "vertical" Bongo tows, from bottom to surface, using paired nets with 71 cm diameter openings and 333 micron mesh at predetermined stations along each of the four nominal depth contours. Stations will be approximately 0.5 nautical miles apart. As the vessel remains stationary on station, the net will be lowered at approximately 40 meters/minute until the weight/cod-ends reach bottom, then retrieved vertically at a rate of 50-60 meters per minute. Both cod-end samples will be preserved in 5% formalin and will be used to estimate fish egg/ larval abundance and to calibrate the egg pump samples. If prevailing winds/currents preclude maintenance of a wire angle of 15 degrees or less, tows will be treated as oblique samples with wire angle measured periodically during each tow and standard haul factors calculated. An egg pump sample will be taken simultaneously with each stationary net tow.

C. MOCNESS plankton tows. MOCNESS (multiple net system with a 1 m2 opening when frame is towed at a 45 degree angle) net tows will be performed to sample the vertical stratification of eggs and larvae along the four nominal depth contours in and around each reserve. The MOCNESS will be fitted with 333 µm mesh nets and 333 µm cod-ends. Each tow will be fished down to within 5 meters of the bottom with a trajectory speed of 50 meters/minute and towed at a vessel speed of 1.5-2.0 knots. The rate of retrieval is to be determined. A frame angle of 45 degrees will be targeted. Tows are to be performed off the beam of the vessel in an effort to avoid any propeller wash/mixing.

D. Given adequate time and conditions at each site, separate additional net tows (manta and/or bongo) will be made in areas of abundant fish eggs. These would include non-quantitative tows dedicated to collecting eggs

and larvae to aid in species identification and for genetic analysis as well as onboard incubation.

E. In order to map habitat types and assess fish communities, diver transects will be conducted each day during daylight hours using one of the inflatable launches. While the main vessel is conducting vertical bongo tows or egg pump transects, diver-transect lines (100-meter lengths of lead-line anchored and bouyed at each end) will be established perpendicular to the shore, from the inshore boundary of the reserve to the offshore boundary, or to a maximum of 90 feet deep. Two divers will swim on either side of the transect line, recording depth, bottom type, kelp cover and fish fauna. It is requested that the McArthur make available at least one diver for these operations. The position of the transect lines will be recorded using a hand-held differential GPS by support personnel in the tending inflatable. Ascents will be made at a rate of 30 feet/minute and include a 3 minute decompression safety stop 15 feet from the surface. The dive plans assume good diving conditions and more than one dive per day will be made, time and conditions permitting.

F. Live fish collections. Efforts to collect adult fish specimens for future genetic analysis and reproduction will be made periodically as time and weather permit. These collections will be accomplished by “hook and line” fishing from the main vessel and, in shallow depths, by fishing from a second inflatable launch. Thus, it is possible that at certain times during daylight hours 3 separate operations will be taking place 1) Egg pump transects and net tows from the main vessel 2) Diving operations from an inflatable launch 3) Fishing operations from the second inflatable. Any live specimens will be kept in 2-3 holding tanks plumbed with continuously running seawater on the aft deck.

MISCELLANEOUS:

It is requested that the ship provide one winch operator around the clock for net-tow operations, as well as one diver from 0800-1600 each day for diving ops. Also request one crewmember be made available to operate ships’ air-compressor to re-fill scuba tanks after completion of daily dive ops.

Cruise meeting - A pre-cruise meeting between the Chief Scientist (and his staff) and the Commanding Officer (and his staff) will be held prior to the start of the cruise to identify operational and logistic requirements (i.e. overtime, modifications, repairs, or procurement).

Hazardous materials - The Chief Scientist shall be responsible for complying with NC Instruction 6280A, Hazardous Materials and Hazardous Waste; policy, guidance and training, dated February 4, 1991, paragraph 7.g and paragraph 9. By Federal law, the ship may not sail without a complete inventory of MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought aboard.

EQUIPMENT: 1. Supplied by the scientific party:

10% Formalin
80% Alcohol
Pint and quart sampling jars/lids
Inside/outside labels
1 m2 MOCNESS frame
1 m2 MOCNESS 333 µm mesh nets
333 µm mesh MOCNESS codends
MOCNESS electronics package
71 cm CalCOFI bongo frames (2)
71 cm CalCOFI 333 micron mesh nets (4)
333 micron mesh cod-ends
Data sheets/clipboards
Live incubation tanks (3)
1/3 HP water chillers (2)
Lauda water baths (4)
Microscopes/lights (2)
Strainers/sieves/beakers
Extension cords
Thermometers (5)
Scintillation vials for egg pump
Squirt bottles
Hoses/fittings
5-gallon buckets (15)
3-gallon buckets (10)
Current drifters (3)
SCUBA gear/wetsuits (3 full sets)
Underwater notepads
Weather observation data sheets
Egg pump van
Egg pump system/hardware/software
CalCOFI Manta net frames (2)
60 cm CalCOFI 505/333 micron mesh nets
Fishing gear/tackle

2. Supplied by RN McArthur

Inflatable launch suitable for 4 divers/equipment
2nd inflatable launch for near shore fishing operations
Starboard A-frame and Pullmaster winch with ¼" wire rope for vertical bongo net tows
Winch monitoring system for measuring wire out
Winch with .322" conductive cable for MOCNESS tows
ADCP
Hand-held differential GPS
1-2 SCUBA divers/gear
Air compressor to fill SCUBA cylinders
Access to 2 continuously running seawater outlets

Hydro weights-100 lbs (2)
Hydro weights- 75 lbs (2)
Lab space/ sink space
110 V power to van
440 V power to van
SCS repeater to van via RS-232 wire
Weld work for egg pump arm
Radio from bridge to van

PERSONNEL:	Russ Vetter, Chief Scientist (Diver)	SWFSC
	Bill Watson, Co-Chief Scientist	SWFSC
	Dave Griffith	SWFSC
	Sharon Charter	SWFSC
	Elaine Acuna	SWFSC
	Dave Ambrose	SWFSC
	Eric Lynn	SWFSC
	Larry Robertson	SWFSC
	Jason Stannard	SWFSC
	Sean Narum	SDSU
	Carol Kimbrell	SWFSC
	Vince Buonaccorsi	SWFSC
	Cindy Taylor* (Diver)	SIO
	Chuck Oliver” (Diver)	SWFSC

*Leg I

**Leg I

SWFSC personnel authorized per diem at the rate of $2.00 per day at end of cruise.

WATCH HOURS: 0000-1159
1200-2359
0600-1800 (Divers)

OVERTIME: 860 hours Charge to account # -TBA
NIGHT DIFF: 672 hours

Date: 12-28-98

Prepared by: Larry Robertson

Approved by: Michael F. Tillman, P h.
Science & Research Director
SWR

Marine Ecological Reserve Program